Melia azedarach L.

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Melia azedarach L.

Taxonomy and nomenclature

Family: Meliaceae

Synonym: *Melia sempervirens* (L.) Sw., *Melia dubia* Cavanilles, *Melia composite* Willd.

Vernacular/common name: Chinaberry, Persian lilac (Eng); Geringging, Mindi (Ind. Java); Marambung (Ind. Sumatera);

Related species of interest: The genus *Melia* contains several important multipurpose species, e.g. *M. volkensii* in E. Africa and *M. toosendan* in Indochina. *M. azedarach* is also closely related to *Azadirachta indica* (Neem - formerly called *Melia azadirachta*) with which it is often confused, e.g. because of related names.

Distribution and habitat

Natural distribution obscured by cultivation and naturalisation. The species originates from southern Asia (India-Pakistan-Iran). It has been introduced and widely cultivated in East-southern Africa, Middle East, America (Bermuda, Brazil and Argentina), Australia, SE Asia-Pacific islands, and southern Europe. In Indonesia it grows mainly in the dryer eastern part of the country.

The species is most competitive in relatively dry areas with less than 900 mm annual rainfall. It occurs from lowland up to 1000 (-1400) masl. It prefers well-drained, deep, sandy loam soil, with pH 5.5-6.5

Uses

The wood is light with density of 0.42-0.65. It can be used for construction, panel, ornament, boxes, matches. It is often planted as a fuelwood species. Fruits and leaves are toxic to humans and livestock. Plant parts contain a number of compounds, e.g. azadirachtin with medical and insecticidal - anti-parasitic properties. The leaves are used to relieve headache, bark is used to treat skin diseases and laxative, and the extracts of leaves and seed are used as insecticide.

Botanical description

Deciduous tree up to 45 m tall, clear bole up to 20 m tall and no buttress. Young bark is grey black and will change to reddish brown with the increasing of age, light to deep furrowed, peels off in small to larger flakes. Leaves compound, bi-pinnate, alternate on the tip of twig, up to 40 cm long. Leaflets ovate or oblong-lanceolate, 2-7 cm long, acute to rounded base, apex acuminate, margin entire to variously serrate.

Infloresence is a panicle, axillary or in axil of rudimentary leaves on short shoots, 10-22 cm long. Flowers are purplish and fragrant, bisexual or male, 5-merous, with tubular calyx, 6-7 mm long and 2 mm in diameter.

1. Tree habit; 2. Leaf; 3. Flowering branch; 4. Section through flower; 5. Fruits. From: PROSEA Asia 11

Fruit and seed description

Fruit : Fruit an ellipsoid-globose drube, 2-4 cm long, 1-2 cm in diameter, exocarp thin and smooth. Endocarp (stone) brownish yellow when ripen.

Seed: Stone ellipsoid 3.5 mm long, 1.5 cm diameter, cross section often somewhat star-shaped. Brown-grey with rough surface. Each stone contain 2-4 (rarely 5) morphological seeds. There are 57.000 seeds (stones) /kg.

Flowering and fruiting

Flowering and fruiting start when trees are 5-6 year old. In aseasonal climate flowering and fruiting may occur almost continuously throughout the year. In seasonal climate flowering occurs mainly at the beginning of the dry season and fruits are mature at the beginning of the rainy season. Fruiting season is often long even in seasonal climate.

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Fruit Harvesting

Seed collection can be done by collecting from the ground after natural fall or after shaking fruit bearing branches. As infructescenses tend to concentrate at the end of long branches, these can be pruned by using long-handled tools. The production of fresh fruits is 10-15 kg per tree.

Processing and handling

Fruits should be separated after collection in fully mature and not fully mature fractions; the latter should be after-ripened for some days under shaded and humid conditions until they take mature colour. Stones from mature (soft) fruits may be extracted manually by rubbing with sand and then cleaning with running water. Larger quantities can be extracted by using mechanical equipment designed for de-pulping fleshy fruits, e.g. coffee de-pulper, Dybvig macerator or adapted food processors. After extraction and cleaning in water, stones should be dried for some days until moisture content is about 15-10% (drying may be omitted or minimised if seeds are to be sown quickly after processing).

OBS: When depulping fruits and disposing waste of fruits precautions must be observed to avoid any oral intake by humans and animals. Ingestion can cause acute poisoning and in extreme cases be fatal.

Storage and viability.

The seeds are semi recalcitrant. They should be kept in high moisture content (10-15%). Fresh stones (moisture content ± 22%) are kept in plastic and then stored in a tin can in a cold room with the temperature of 18-20^{O}C, RH 70-80%. Using this treatment, the germination percentage of the seeds can be maintained up to 20-30% after 10-12 weeks in storage.

To prevent fungal attack, seed can be mixed with fungicide powder, for instance Dithane M-45 or Benlate.

Dormancy and pretreatment.

Seeds of *M. azedarach* are hard and may take up to 3 months to germinate without pretreatment. Pretreatment should aim at breaking the physical barrier to water absorption and expansion of the embryo. Pretreatment can be done manually by cracking or cutting part of the endocarp, or by treatment with sulphuric acid (H_2SO_4). Acid treatment should be with high concentration acid (beware of safety precautions!) for 40 minutes.

Sowing and germination.

Germination is epigeal. Sowing after pretreatment in plastic pots with the mixture sand and soil (1:1). Suitable practice is by burying the seeds into the media in horizontally, ¾ part depth then covered with fine sand. Since stones contain more than one seed a germination percentage of >100% can be achieved. Transplanting medium may consist of a mixture of soil, sand and manure (7:2:1) and added 1 spoon of TSP or NPK in every 1 m^3 of media. Transplanted seedlings are plantable in the field after 3-4 month.

Phytosanitary problems

Seedlings are, as most other Meliaceae, prone to attack by shoot borers, for *M. Azadarach* e.g. by *Hypomeces squamosus* and *Aristobia approximator*.

Vegetative propagation

Propagation by stem cutting, marcotting or root suckers is possible but is reportedly difficult.

Selected readings

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